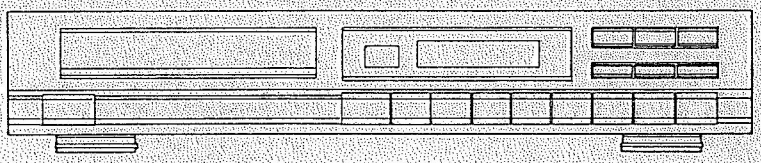
SERVICE MANUAL

COMPACT DISC PLAYER

MODEL : CD-3704



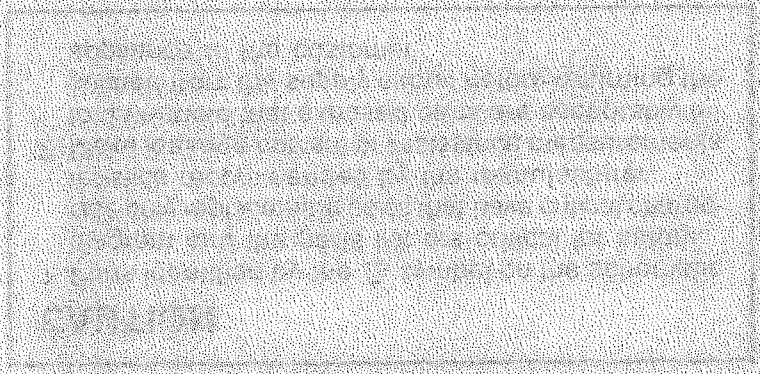
CAUTION

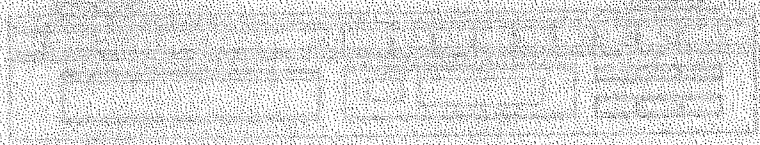
1. Parts identified by the ⚠ symbol on the schematic diagram and the parts list are critical for safety. Use only replacement parts that have critical characteristics recommended by the manufacturer.
2. Make leakage-current or resistance measurements to determine that exposed parts are acceptably insulated from the supply circuit before returning the appliance to the customer.

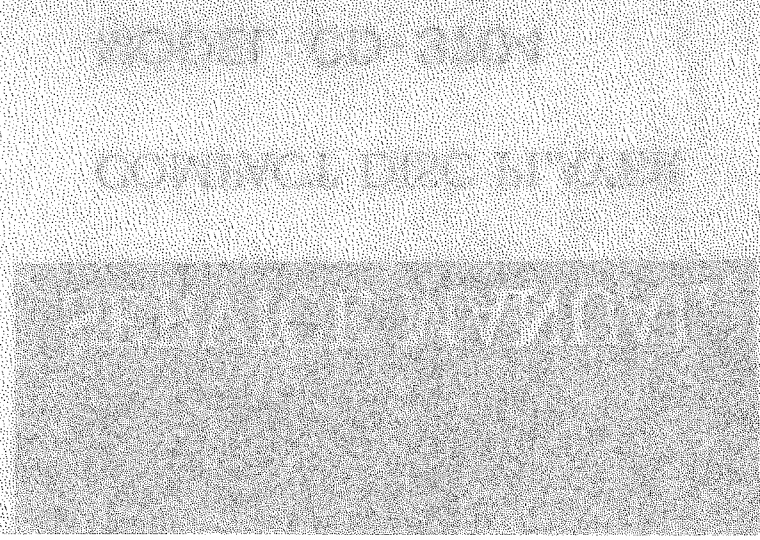
Specifications

Format	Compact disc, digital audio
Pick-up	3-beam semiconductor laser
No. of channels	2 channels (stereo)
Decoding (D/A)	16-bit dynamic/channel
Frequency response	20Hz - 20KHz
Total harmonic distortion	Less than 0.08% (1KHz)
Signal-to-noise ratio (S/N)	Better than 85dB
Dynamic range	Better than 80dB
Wow and flutter	Below measurable limit
Output voltage/load impedance	
Output	2V/10K ohms
Power requirements	AC 120V/220V/240V, 50/60Hz
For U.S.A. & Canada	AC 120V, 60Hz
For Europe	AC 220V, 50Hz
Power consumption	14.5 watts
Dimensions	420 mm (W)
	80 mm (H)
	270 mm (D)
Weight	2.8 Kg

* Design and specifications subject to changes without notice for improvements.

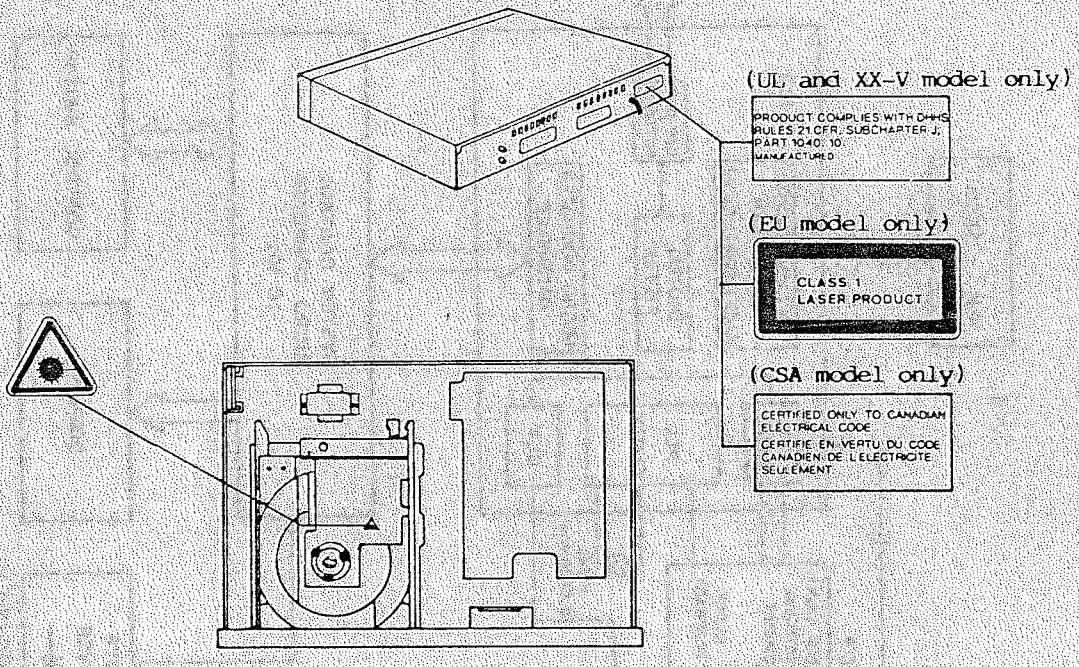




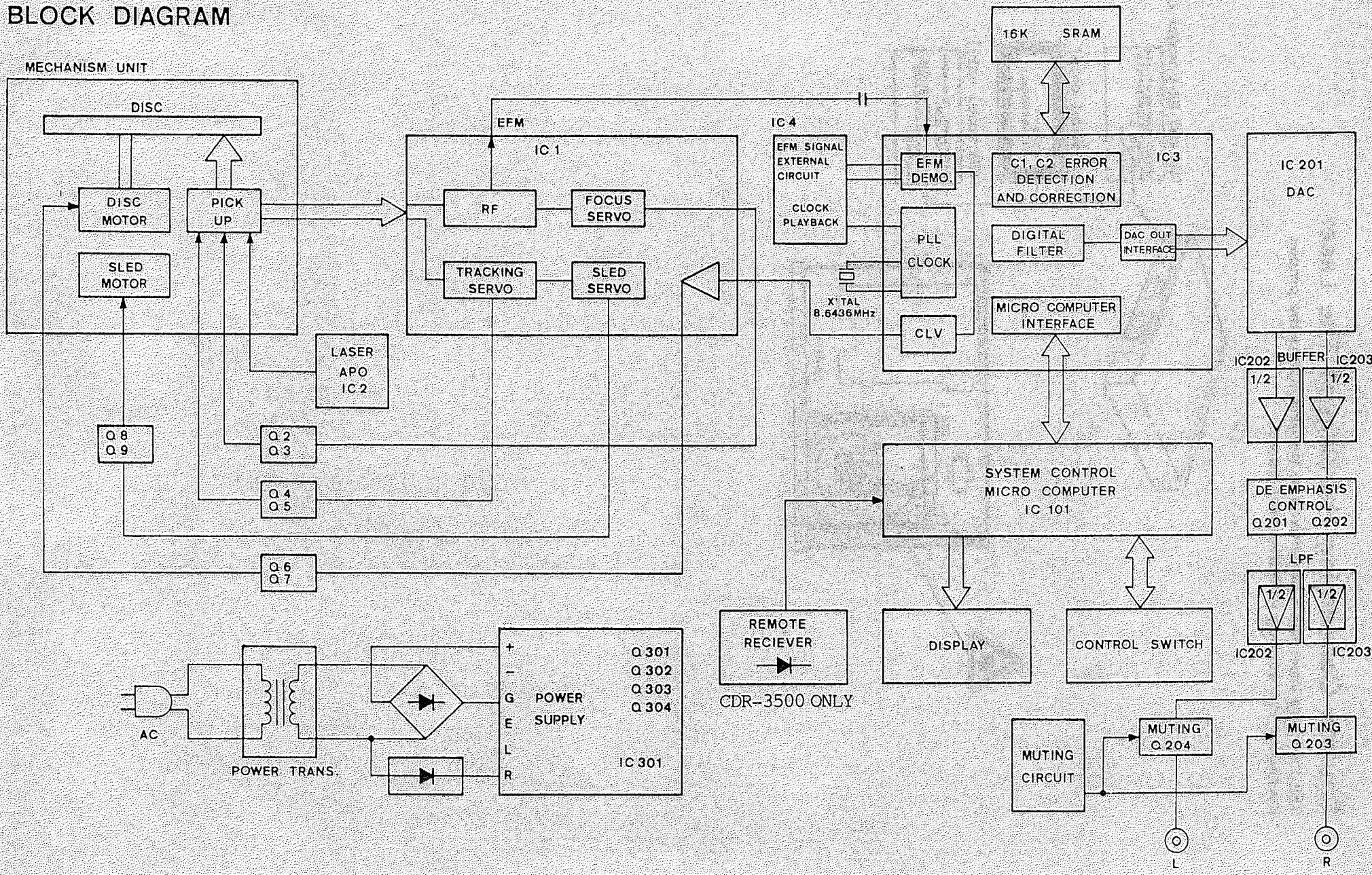


Caution Concerning Handling of The Laser

The following label has been affixed to the unit, listing the proper procedure for working with the laser beam.

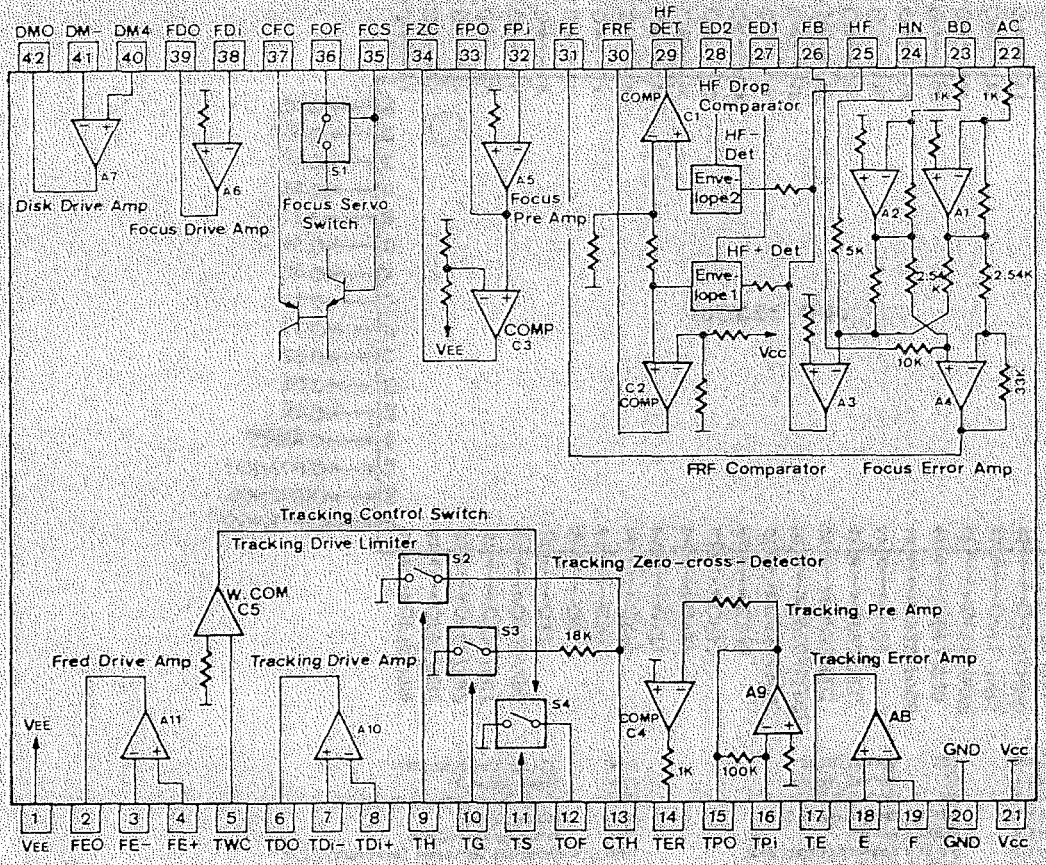

(UL and XX-V model only)
PRODUCT COMPLIES WITH DHHS RULES 21 CFR, SUBCHARTER J, PART 1040. 10.
MANUFACTURED
(EU model only)
CLASS 1
LASER PRODUCT
(CSA model only)
CERTIFIED ONLY TO CANADIAN ELECTRICAL CODE
CERTIFIE EN VERTU DU CODE CANADIEN DE L'ELECTRICITE SEULEMENT

BLOCK DIAGRAM

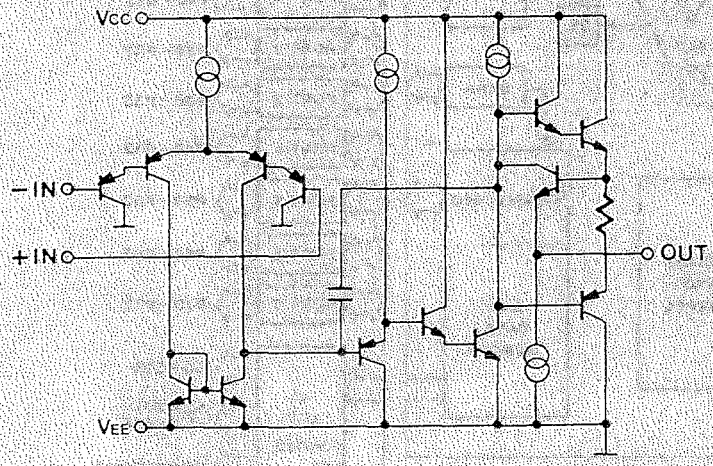


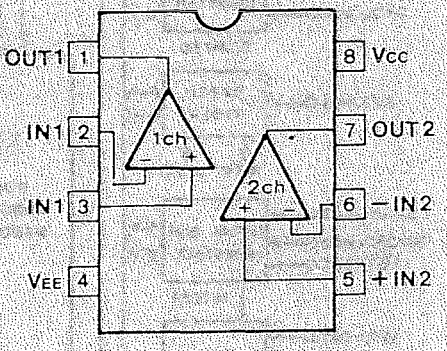
INTERIOR BLOCK DIAGRAM & IC TERMINAL FUNCTION

IC1 XC488AO (Focus & Tracking Servo)

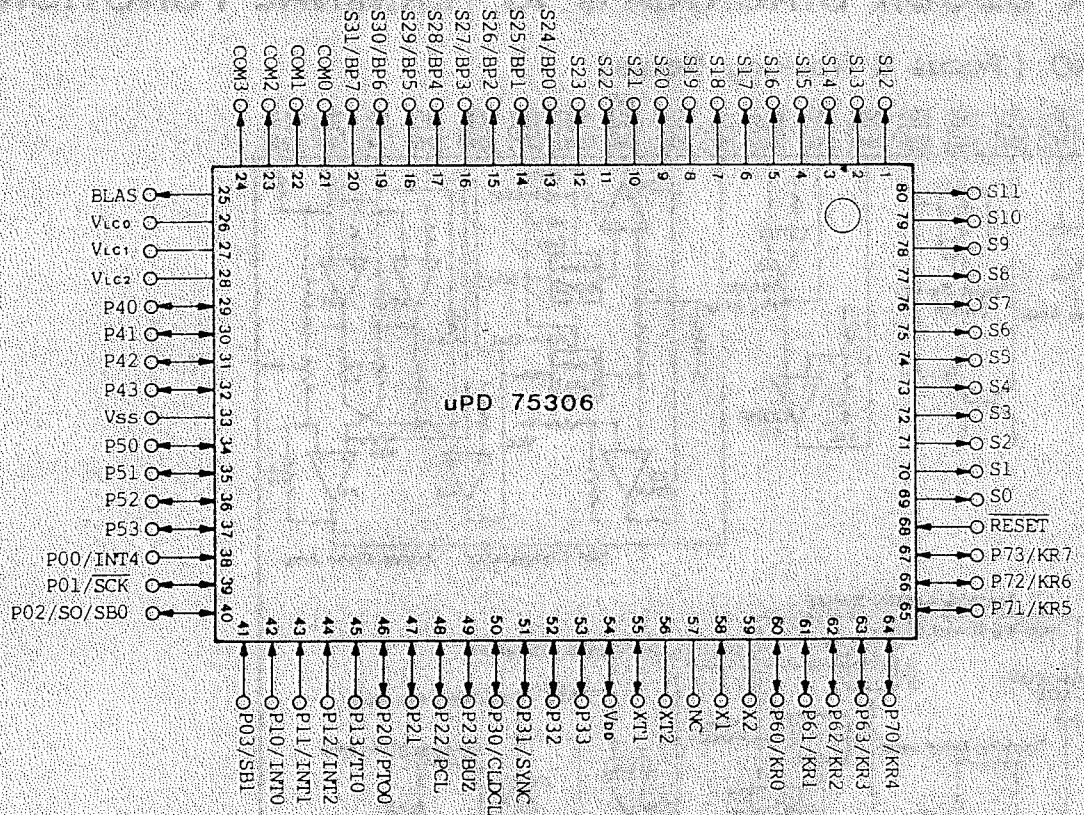

DMO DM- DM4 FDO FDi CFC FOF FCS FZC FPO FPJ FE FRF HF DET ED2 ED1 FB HF HN BD AC
42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22
Disk Drive Amp
Focus Drive Amp
Focus Servo Switch
Focus Pre Amp
COMP
HF Drop Comparator
HF- Det
Enve lope2
HF + Det
Enve lope1
Vcc
VEE
FRF Comparator
Focus Error Amp
Tracking Control Switch
Tracking Drive Limiter
Tracking Zero-cross-Detector
W. COM
Fred Drive Amp
Tracking Drive Amp
Tracking Pre Amp
Tracking Error Amp
18K
1K
100K
10K
5K
2.54K
33K
GND
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
VEE FEO FE- FE+ TWC TDO TDi- TDi+ TH TG TS TOF CTH TER TPO TPi TE E F GND Vcc

IC2 BA10358F (APC)

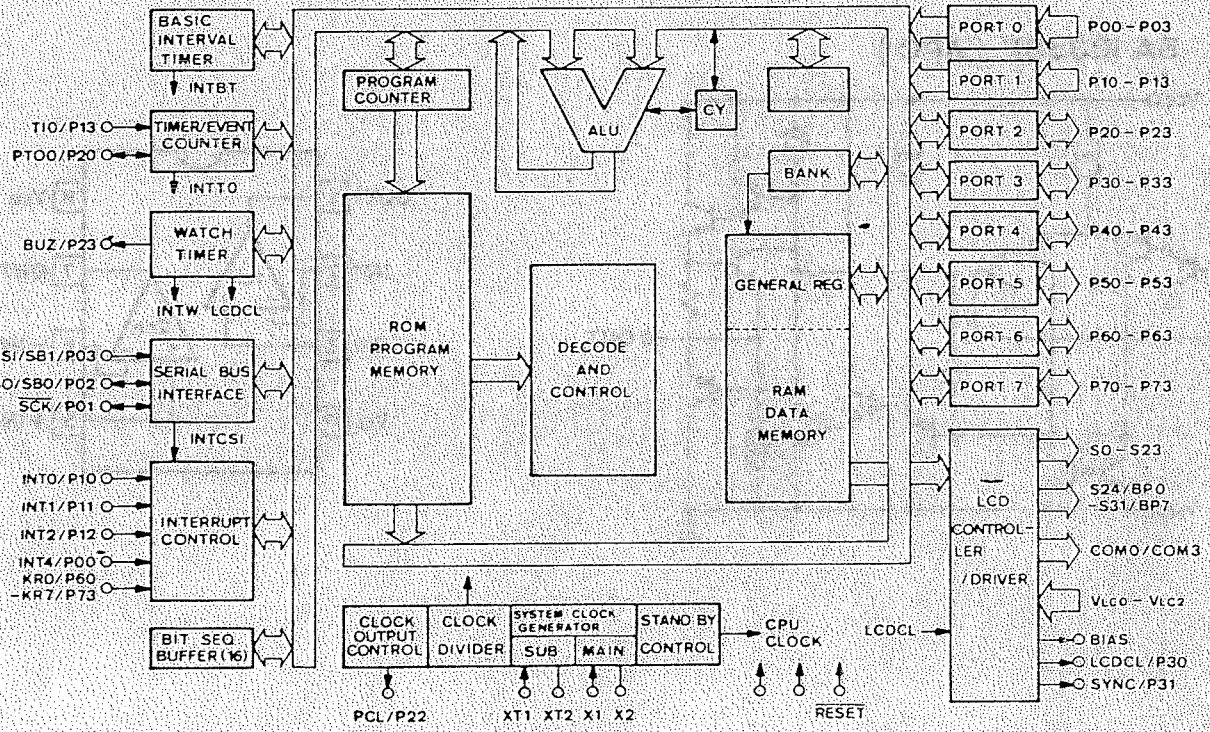




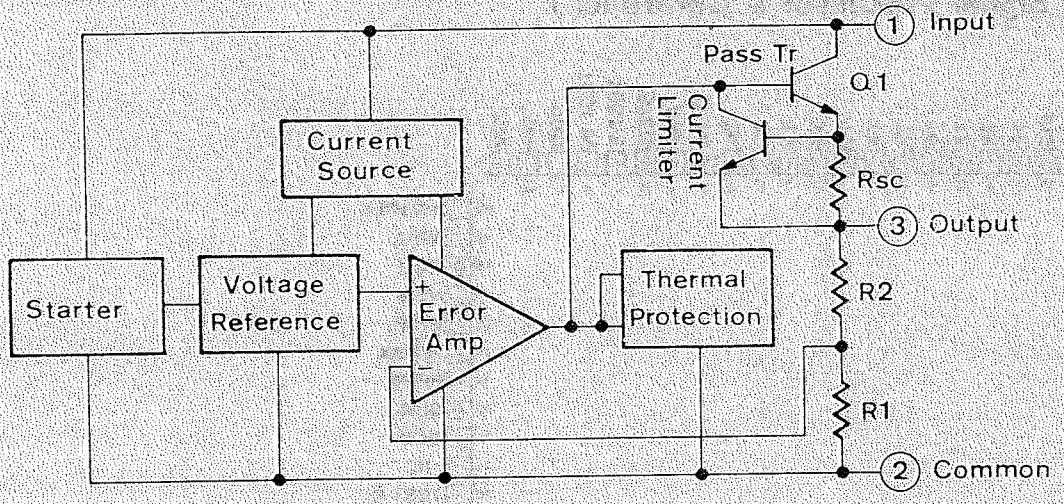
IC101 uPD75306GF (Micon)


uPD 75306
COM3 COM2 COM1 COM0 S31/BP7 S30/BP6 S29/BP5 S28/BP4 S27/BP3 S26/BP2 S25/BP1 S24/BP0 S23 S22 S21 S20 S19 S18 S17 S16 S15 S14 S13 S12
BLAS VLC0 VLC1 VLC2 P40 P41 P42 P43 VSS P50 P51 P52 P53 P00/INT4 P01/SCK P02/SO/SB0
S11 S10 S9 S8 S7 S6 S5 S4 S3 S2 S1 S0 RESET P73/KR7 P72/KR6 P71/KR5
P03/SB1 P10/INT0 P11/INT1 P12/INT2 P13/TI0 P20/PTO0 P21 P22/PCL P23/BUZ P30/CLDCL P31/SYNC P32 P33 VDD XT1 XT2 NC X1 X2 P60/KR0 P61/KR1 P62/KR2 P63/KR3 P70/KR4

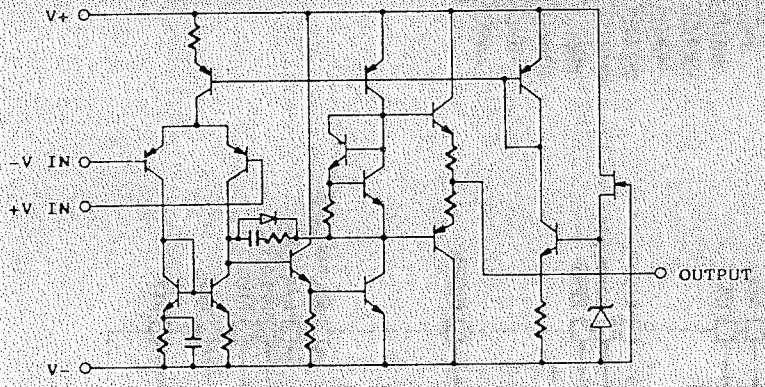
P00-03	: Port 0	SCK	: Serial Clock	SYNC	: LCD Synchronization
P10-13	: Port 1	SI	: Serial Input	TI0	: Timer Input 0
P20-23	: Port 2	SO	: Serial Output	PTO0	: Programmable Timer Output 0
P30-33	: Port 3	SB0, 1	: Serial Bus 0, 1	BUZ	: Buzzer Clock
P40-43	: Port 4	RESET	: Reset	PCL	: Programmable Clock
P50-53	: Port 5	S0-31	: Segment Output 0-31	INT0, 1, 4	: External Vectored Interrupt 0, 1, 4
P60-63	: Port 6	COM0-3	: Common Output 0-3	INT2	: External Test Interrupt 2
P70-73	: Port 7	VLC0-2	: LCD Power Supply 0-2	X1, 2	: Main-system Clock Oscillation 1, 2
BP0-7	: Bit Port	BLAS	: LCD Power Supply bias Control	XT1, 2	: Subsystem Clock Oscillation 1, 2
KR0-7	: Key Return	LCDCL	: LCD Clock	NC	: Non-connection

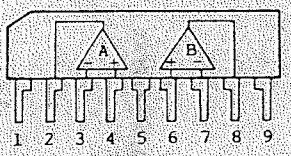


IC 301 AN78N05 (Regulator)



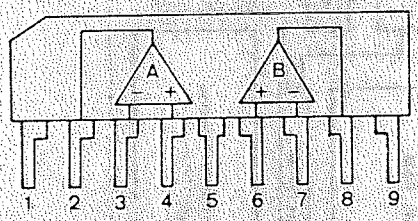
IC 4 NJM2068S (OP. Amp)





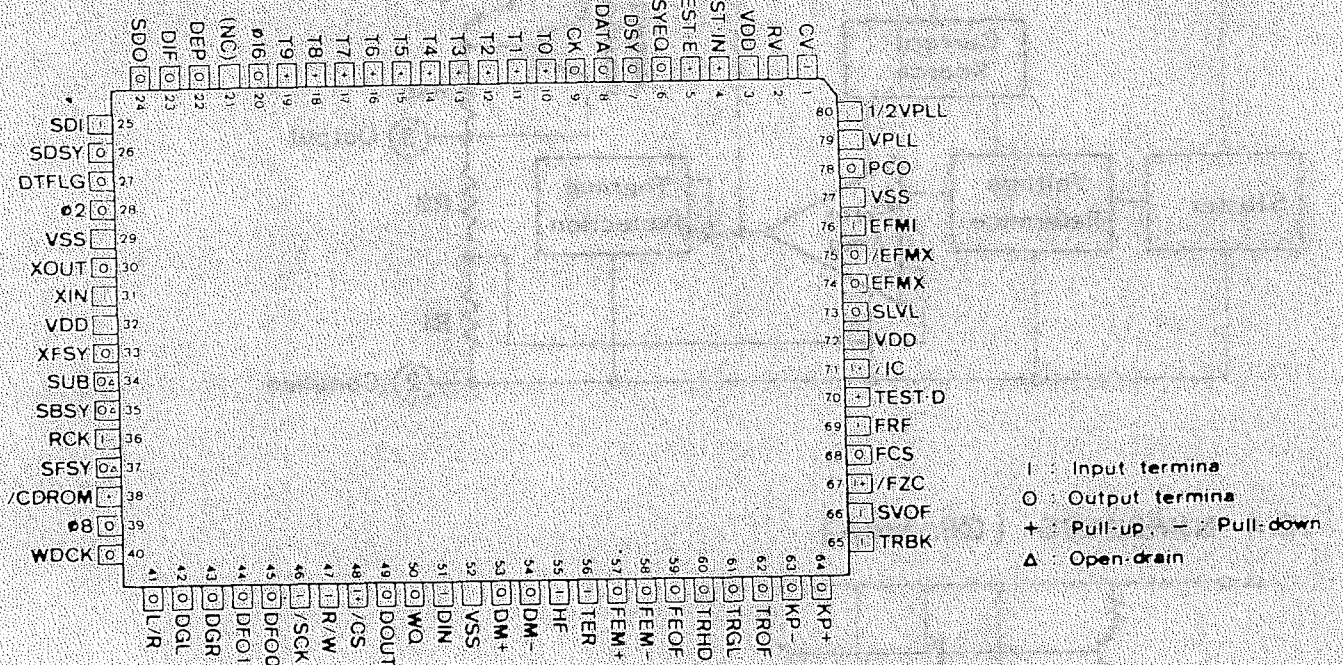
1. V+
2. A OUTPUT
3. A-INPUT
4. A+INPUT
5. V-
6. B+INPUT
7. B-INPUT
8. V OUTPUT
9. V+

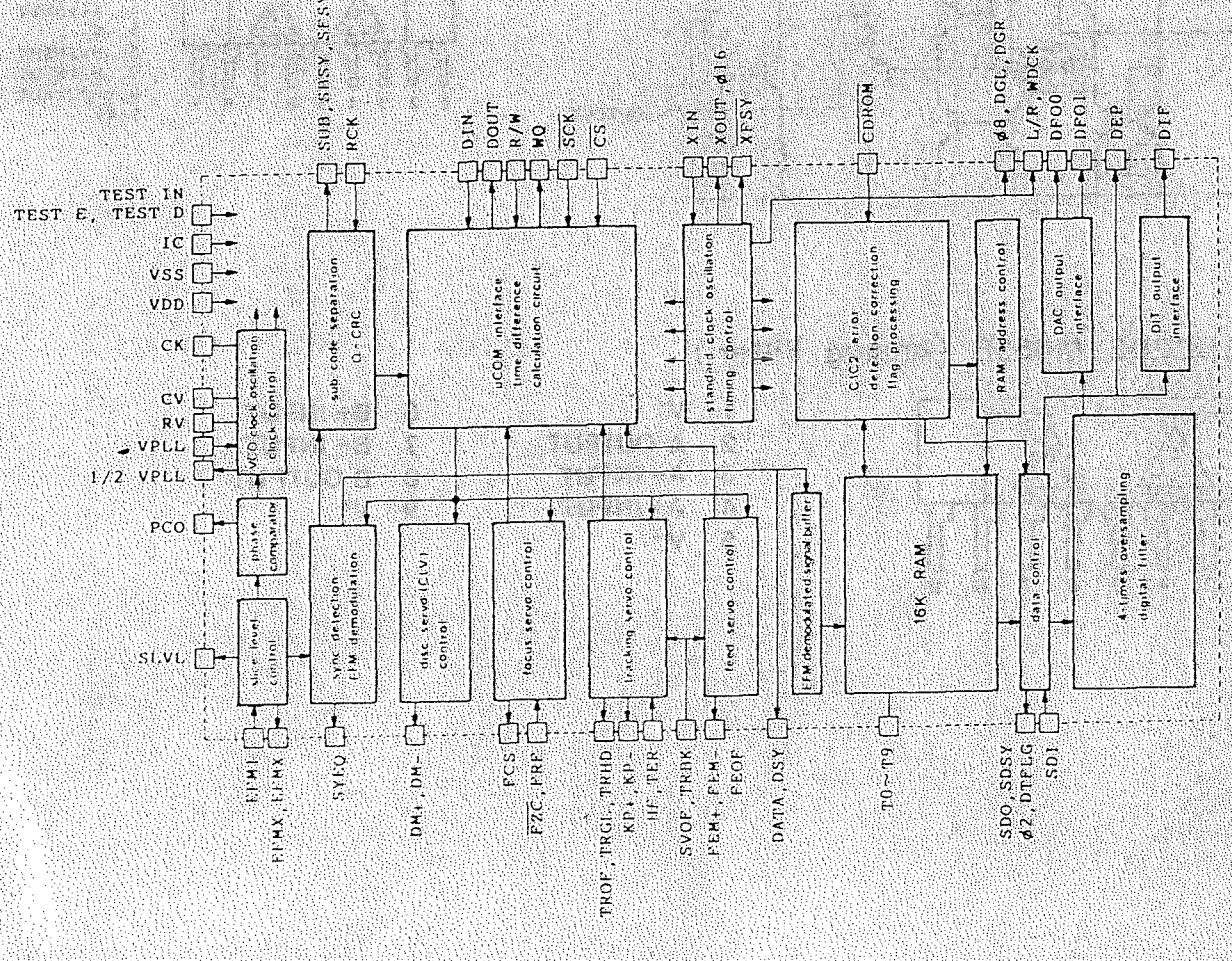
IC202/IC203 M4558 (Analog Filter)



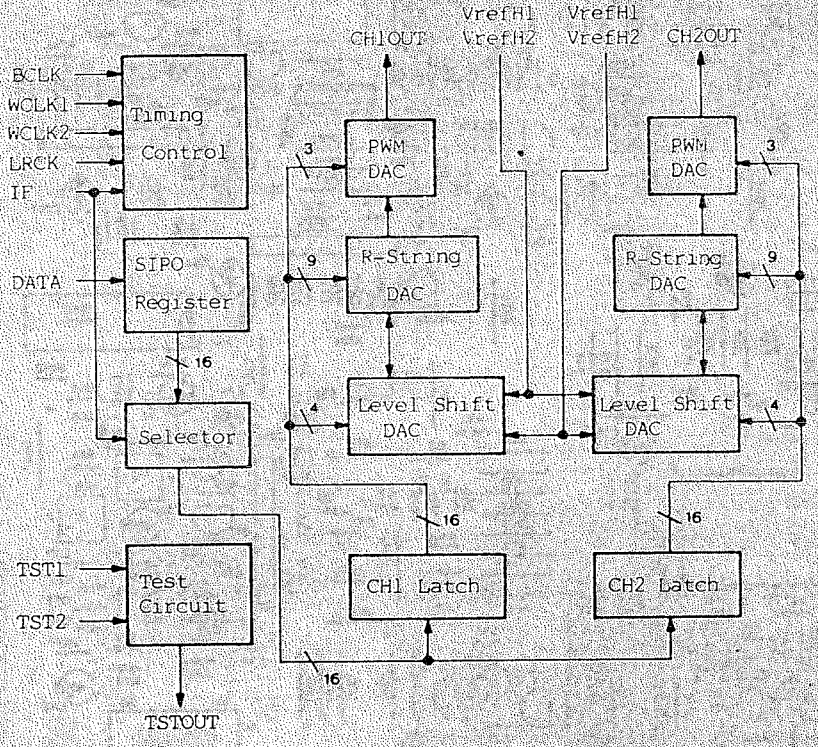
1	V+	6	B+ INPUT
2	A OUTPUT	7	B- INPUT
3	A- INPUT	8	B OUTPUT
4	A+ INPUT	9	V+
5	V-		

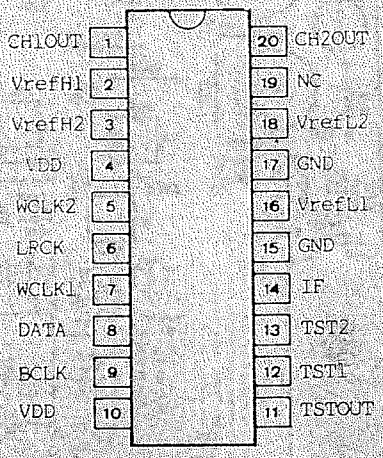
IC 3 YM 7121B (Signal Processor & Controller)



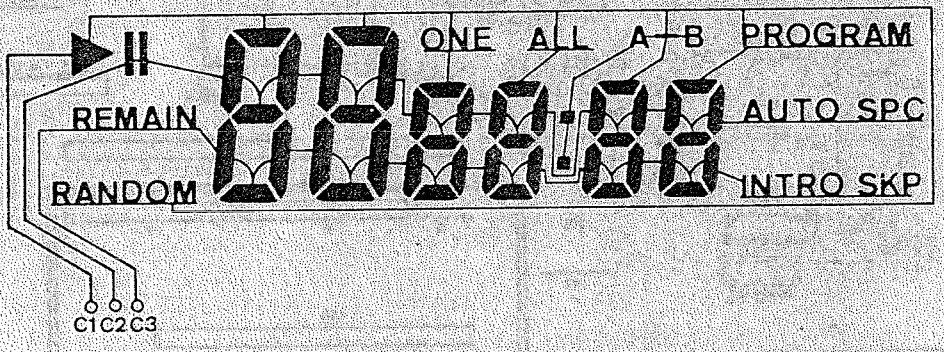


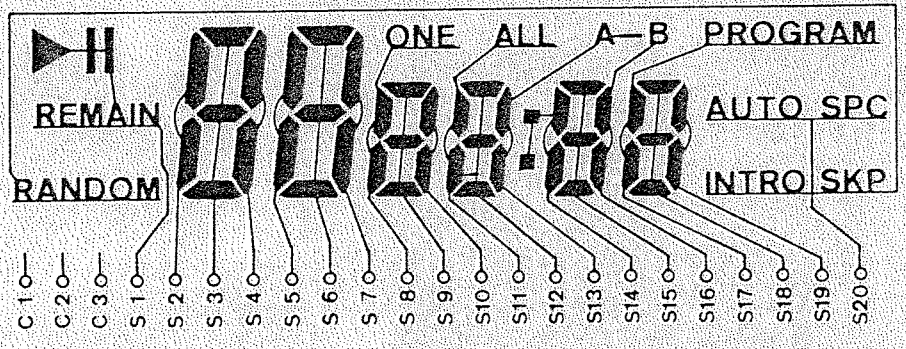
IC 201 LC 7881 (D-A Converter)



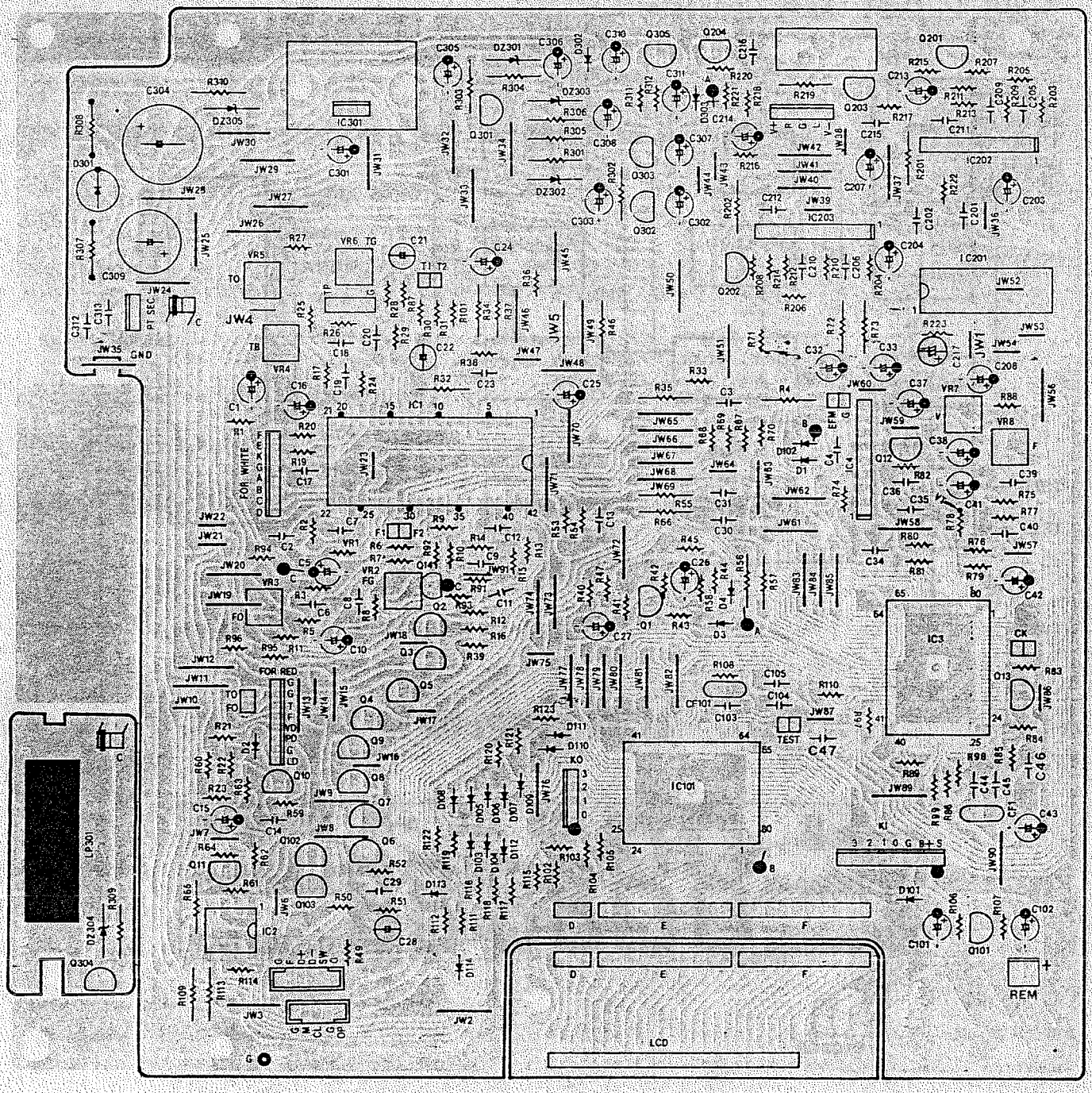


LCD DISPLAY





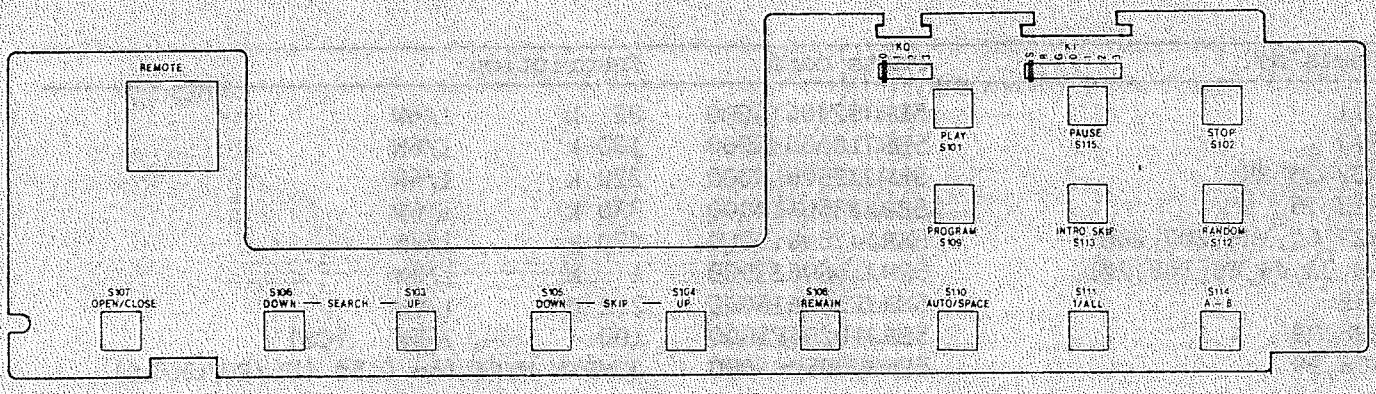
PARTS LOCATION OF BOARD



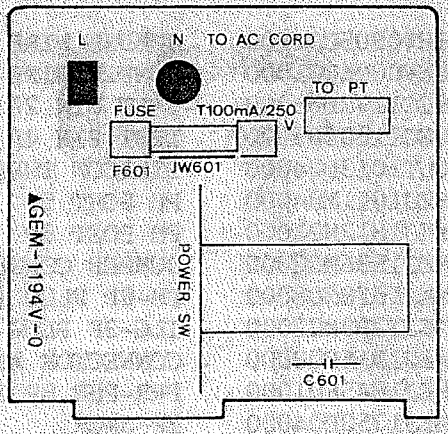
Parts No.	Parts cord	Description	
	5GPBZ152006000	MAIN P. C. BOARD ASS'Y (2CPXF1464A)	
IC'S			
IC1	5EICXC488A7000	XC 488A0	
IC2	5EICBA10356800	BA 10358	
IC3	5EICYM7121B00	YM 7121B	
IC4	5EICNJM2068S0	NJM 2068S	
IC101	5EICUPD753406G	uPD 75306GF161	
IC201	5EICLC7881200	LC 7881	
IC202,203	5EICNJM4558S0	NJM 4558S	
IC301	5EICAN78N04500	AN 78N05	
TRANSISTORS			
Q2	5ESCC2060R10I0	2SC 2060R	
Q3	5ESCA0934R10I0	2SA 934R	
Q4,6,9,102,302	5ESCC2001C6LI0	2SC 2001C.L	
Q1,12,101,203,204	5ESCC0945C90I0	2SC 945C.T	
Q201,202			
Q5,7,8,10,103,303	5ESCA0952C30I0	2SA 952C	
Q11,13,301,305	5ESCA0733C00I0	2SA 733C	
DIODE			
D1,2,101-114,302,303	5EDSS133124000	1SS133T77	
DZ301	5EDZ056Z009000	ZENER DIODE 05A Z5.6Z TP-3	
DZ302,303	5EDZ075C002000	ZENER DIODE MTZ-7.5C	
DZ305	5EDZ091X002000	ZENER DIODE 05A Z9.1X TP-3	
D301	5ERBW005D02000	RECTIFIER W005 BP151M,B050L	
VR3,5,7	5ERH104A100000	POT. SEMI-FIXED, 10 KA	
VR2,4,6,8	5ERH105A101000	POT. SEMI-FIXED, 100 KA	
CRYSTALS			
CF1	5ECF1693440000	CRYSTAL, 16.9344M HC-49/U	
CF101	5ECF040M227000	CRYSTAL, KBR-4.0M SL1	
CAPACITORS			
C7	5ECC300IFI7000	3 pF	CERAMIC
C44,45,201,202	5ECC221IFI7000	22 pF	CERAMIC
C2,23,103,104	5ECC331IFI7000	33 pF	CERAMIC
C17,19	5ECC471IFI6000	47 pF	CERAMIC
C4,40	5ECC102IFI5000	100 pF	CERAMIC
C20,211,212	5ECC332IFI8000	330 pF	CERAMIC
C14,312,313	5ECC224IFI9000	223 pF	CERAMIC
C36,46,47,105	5ECC105LDI0000	104 pF	CERAMIC
C12	5ECC472IFI7000	470 pF	CERAMIC
C22	5ECE825N6I7F00	0.82uF/50V (NP)	ELECT
C21	5ECE106N6I3F00	1 uF/50V (NP)	ELECT
C28	5ECE226N6I6F00	2.2 uF/50V (NP)	ELECT
C101	5ECE106F6I0000	1 uF/50V	ELECT
C27	5ECE226F6I3000	2.2 uF/50V	ELECT
C41,42,213,214	5ECE476D6I8000	4.7 uF/25V	ELECT
C24,102,203,204	5ECE107F6I1000	10 uF/50V	ELECT

Parts No.	Parts cord	Description	
C5	5ECE337B6I6000	33 uF/10V	ELECT
C1	5ECE477B6I5000	47 uF/10V	ELECT
C10,15,16,25,26,32,33, C37,38,43,207,208,301, C302,305,307,310,311	5ECE108B6I4000	100 uF/10V	ELECT
C303,306,308	5ECE228B7I0000	220 uF/10V	ELECT
C217	5ECE478B9I5100	470 uF/10V	ELECT
C309	5ECE229CIC8100	2200uF/16V	ELECT
C304	5ECE339CKC7100	3300uF/16V	ELECT
C13	5ECP103KFI1000	102 pF	MYLAR
C6,29	5ECP153KFI6000	152 pF	MYLAR
C209,210,215,216	5ECP333KFI4000	332 pF	MYLAR
C3,8,30,31	5ECP104KFI2000	103 pF	MYLAR
C9	5ECP274KFI0000	273 pF	MYLAR
C205,206	5ECP474KFI4000	473 pF	MYLAR
C39	5ECP684KFI1000	683 pF	MYLAR
C18	5ECP824KFI7000	823 pF	MYLAR
C34,35	5ECP105KFI3000	104 pF	MYLAR
C11	5ECP185KDC5000	184 pF	MYLAR
RESISTORS			
R49	5ERJ22006I9000	2.2 ohm	1/6W
R63	5ERJ22106I0000	22	1/6W
R21,223	5ERJ91106I6000	91	1/6W
R10,205,206	5ERJ33206I1000	330	1/6W
R25,88	5ERJ47206I0000	470	1/6W
R9	5ERJ56206I4000	560	1/6W
R16,39,42,89,97	5ERJ68206I7000	680	1/6W
R1,77,217,218	5ERJ82206I3000	820	1/6W
R62	5ERJ10306I9000	1 k	1/6W
R203,204	5ERJ12306I5000	1.2 k	1/6W
R36,209,210	5ERJ22306I2000	2.2 k	1/6W
R50	5ERJ27306I7000	2.7 k	1/6W
R6,76,78,79,83,211-214	5ERJ47306I1000	4.7 k	1/6W
R60,87	5ERJ56306I5000	5.6 k	1/6W
R26,80,81	5ERJ68306I8000	6.8 k	1/6W
R28,43,70,71,74,84,101, R107,111-113,311	5ERJ10406I0000	10 k	1/6W
R47,51,114	5ERJ12406I6000	12 k	1/6W
R41,58,102-105	5ERJ15406I5000	15 k	1/6W
R2,14,29,30	5ERJ18406I4000	18 k	1/6W
R19,20,40,110,115-122, R123,215,216	5ERJ22406I3000	22 k	1/6W
R3,5,31	5ERJ33406I3000	33 k	1/6W
VR1	5ERJ27406I8000	27 k	1/6W
R45	5ERJ39406I1000	39 k	1/6W
R7,64,67,68,82,85	5ERJ47406I2000	47 k	1/6W
R52	5ERJ56406I6000	56 k	1/6W
R13,53,54,312	5ERJ68406I9000	68 k	1/6W
R69,222	5ERJ10506I1000	100 k	1/6W
R15	5ERJ15506I6000	150 k	1/6W

Parts No.	Parts cord	Description
R11	5ERJ82406I5000	82 k 1/6W
R17	5ERJ18506I5000	180 k 1/6W
R22-24,38	5ERJ22506I4000	220 k 1/6W
R12,75	5ERJ33506I4000	330 k 1/6W
R27,61,106,207,208	5ERJ47506I3000	470 k 1/6W
R8,33,44,86,108,221	5ERJ10606I2000	1 M 1/6W
R59	5ERJ22606I5000	2.2 M 1/6W
R98,99	5ERJ10206F5000	100 1/6W (CS)
R98,99	5EWV0005D04000	JUMPER WIRE 5mm 0.5# (UL/EU/UK/AS)
R301,305	5ERJ471F2C3000	47 ohm 1/2W
R307,308	5ERD1000404100	1 ohm 1/4W F/R
R72,73	5ERJ47104I3000	47 1/4W
R303	5ERJ12204I8000	120 1/4W
R4,310	5ERJ22204I5000	220 1/4W
R302,304,306	5ERJ27204I0000	270 1/4W
R46	5ERJ10304I3000	1 k 1/4W
R37	5ERJ22304I6000	2.2 k 1/4W
R65,201,202	5ERJ47304I5000	4.7 k 1/4W
R219	5ERJ68304I2000	6.8 k 1/4W
R113	5ERJ12404I0000	12 k 1/4W
R109	5ERJ22404I7000	22 k 1/4W
R32,34	5ERJ39404I5000	39 k 1/4W
R56,57	5ERJ10504I5000	100 k 1/4W
R35,55,66	5ERJ82504I0000	820 k 1/4W
	5EWV0005D04000	JUMPER WIRE 5 mm 0.5#
	5EWV0006D01000	JUMPER WIRE 10mm 0.6#
	5MEC1173D05000	TEST PIN 2P
	5MEC1180D05000	TEST PIN 4P
	5GUT1013D04000	SILICON TUBE 1# 13mm
	5MEJ1811M04000	PH POST 5P
	5MEJ1812M01000	PH POST 6P
	5MEJ1536M02000	JUMPER CONNECTOR 4P
	5MEJ1528M05000	PH-8P PLUG (H)
	5MEJ1288M02000	ILG-3P PLUG (H)
	5MEJ1916F08000	CONNECTOR ASS'Y PH-8P-7P 160mm
	5MEJ1845F01000	PHR-PHR 8P 20080 T28 130mm
	5MEJ1758D04000	2P JACK
	5MES1095D07000	HEAT SINK H = 22mm
	5MEJ1539M03000	JUMPER CONNECTOR 7P
	2CPXF1464B	DISPLAY P. C. BOARD ASS'Y
	5GDT3002008000	LCD DISPLAY
	2CPXF1464C	LAMP P. C. BOARD ASS'Y
DZ304	5EDZ091X002000	ZENER DIODE 05A Z9.1X TP-3
LP301	5GEL0910026000	LAMP 20mm 9V .10A
Q304	5ESCA0934R10I0	2SA 934R
R309	5ERJ27204I0000	RESISTOR, 270 ohm 1/4W

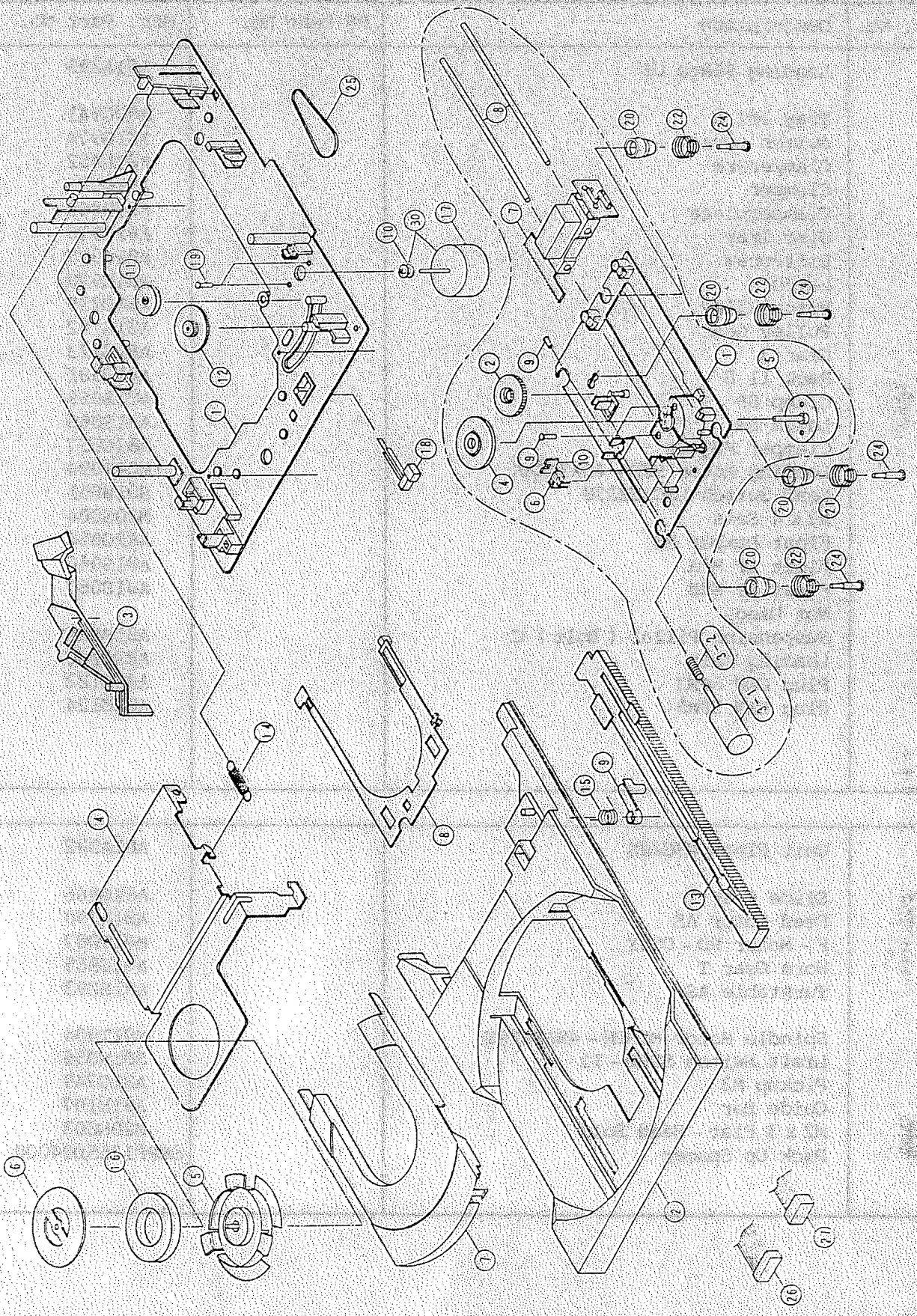


Parts No.	Parts cord	Description
	5GPBF151101000	TACT SWITCH P. C. BOARD
	5GWP1031D02000	TACT SWITCH
	5GRR0003D07000	REM-CON REC.



Parts No.	Parts cord	Description
	5GPBF150517000	POWER SWITCH P. C. BOARD
PF1	5GWA0960D02000	POWER SWITCH
C601	5ECC473FT09000	CERAMIC CAP 472 pF 400V
	5MEC1130D00000	AC PIN TERMINAL
PT	5MEC1181D02000	2P TERMINAL
PF1	5GWA0960D13000	POWER SWITCH
JW601	5MEC0822D07000	BARE WIRE 0.6# 10mm

CD MECHANISM EXPLODED VIEW



CD MECHANICAL PARTS LIST

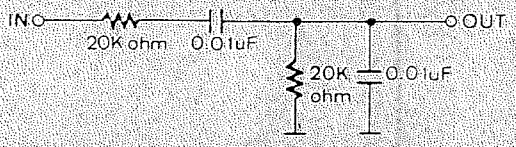
Ref. No.	Description	RS Part No.	Mfr. Part No.
1	Loading Plate OS		A81A295
2	Tray 201 H		A82G141
3	Switch Lever		A81G974
4	Clamperarm		A81P462
5	Clamper		A81G975
6	Clamperplate		A81P463
7	Disc Tray		A81G976
8	Liftercam		A81G977
9	Latch		A81G978
10	Motorpulley		A81G235
11	Pulley Gear		A81G122
12	Gear 3		A81G123
13	Rack 11 B		A81G581
14	Clamp SP		A81S059
15	Latch SP		A81S060
16	Clamper Magnet		A82G057
17	Loading Motor MDN - 4RA3EZAS		M01T094
18	Leaf Switch LSC122338		S01W051
19	M2 x 4 Sems		M20S004
20	Float Damper M3		A82G056
21	Float SP M3A		A81S066
22	Float SP M3B		A81S067
23	Not Used		
24	Suspension Pillar (Bolt) C		A81H085
25	Loading Belt		A82G180
26	Plug CNW 6PM3		A82G123
27	Plug CNW 5PM3		A82G124

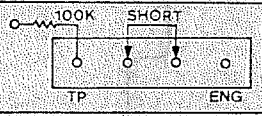
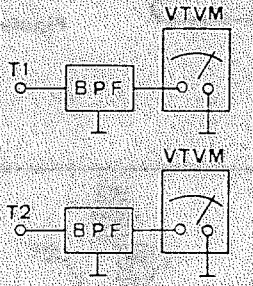
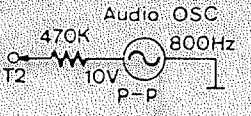
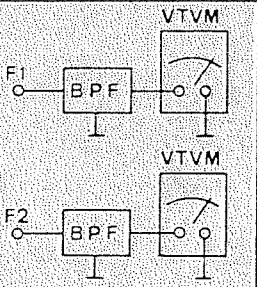
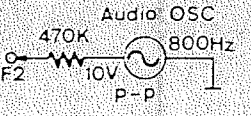
1	Unit Plate M3G20S		A81A292
2	Slide Gear T		A81G966
3	Feed Motor AS		A81A290
3 - 1	F - Motor RD - 050Y		M01T087
3 - 2	Worm Gear T		A81G965
4	Turntable AS		A81S293
5	Spindle Motor MTMDN - 4RA3EZAS		M01T904
6	Limit Switch SPPB - 11		S01W056
7	Pickup M3		A81G749
8	Guide Bar		A81H107
9	M2 x 3 Flat - Head Bold		M20N003
10	Pick Up Spacer		5MPF1755D04000

ADJUSTMENT

1. Turn off power before removing top cover.
2. See Fig.1 & Fig.2 for adjustment.
3. Test disc is SONY YEDS 18 TYPE 4.
4. For adjustment the following filters is required.

Band Pass Filter (B.P.F.)



STOP	SUBJECT	INPUT	ADJUST FOR	MEASURE OUTPUT	ADJUST	DESCRIPTION
1	Focus Offset	NONE	VR 3	Connect scope to point FO and GND	DC = 0V	
2	Tracking Offset	NONE	VR 5	Connect scope to point TO and GND	DC = 0V and Noise = MIN	
3	VT	NONE	VR 7	Connect DC meter to point VT and GND	DC = 3.9V	
4	VCO	NONE	VR 8	Connect F counter to point CK and GND	F = 4.3218 MHz ±10KHz	EFM short across G
5	TE Balance	Play disc	VR 4	Connect scope to point TP and GND	Adjust a = b, Scope DC	
6	Tracking Gain	Play 7th music of DISC (No signal)	VR6	Connect VTVM to point T1 through BPF and connect VTVM to point T2 through BPF	 Adjust to T1 = T2 +3.5dB	
7	Focus Gain	Play 7th music of DISC (No signal)	VR2	Connect VTVM to point F1 through BPF and connect VTVM to point F2 through BPF	 Adjust to F1 = F2 +2.5dB	
8	Repeat alignment step 1 and 2					

TEST POINT

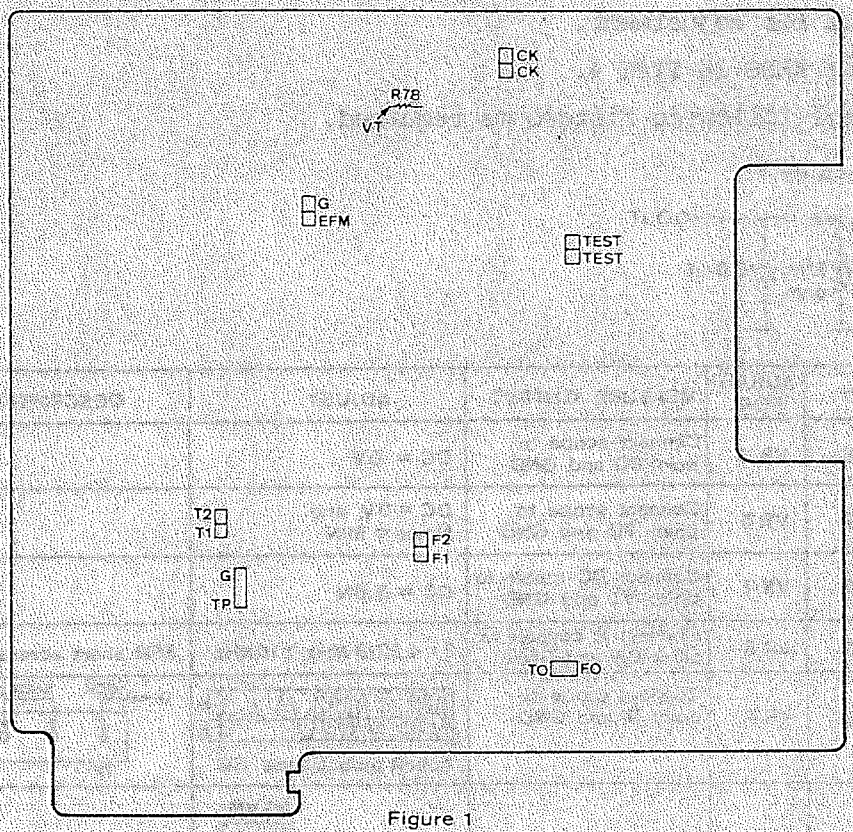


Figure 1

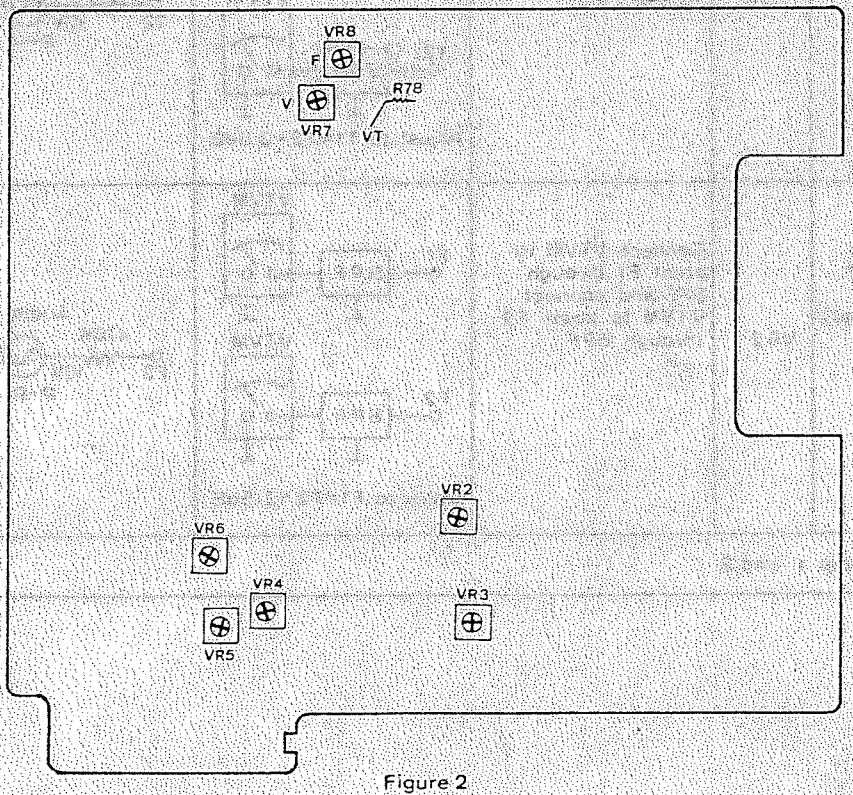
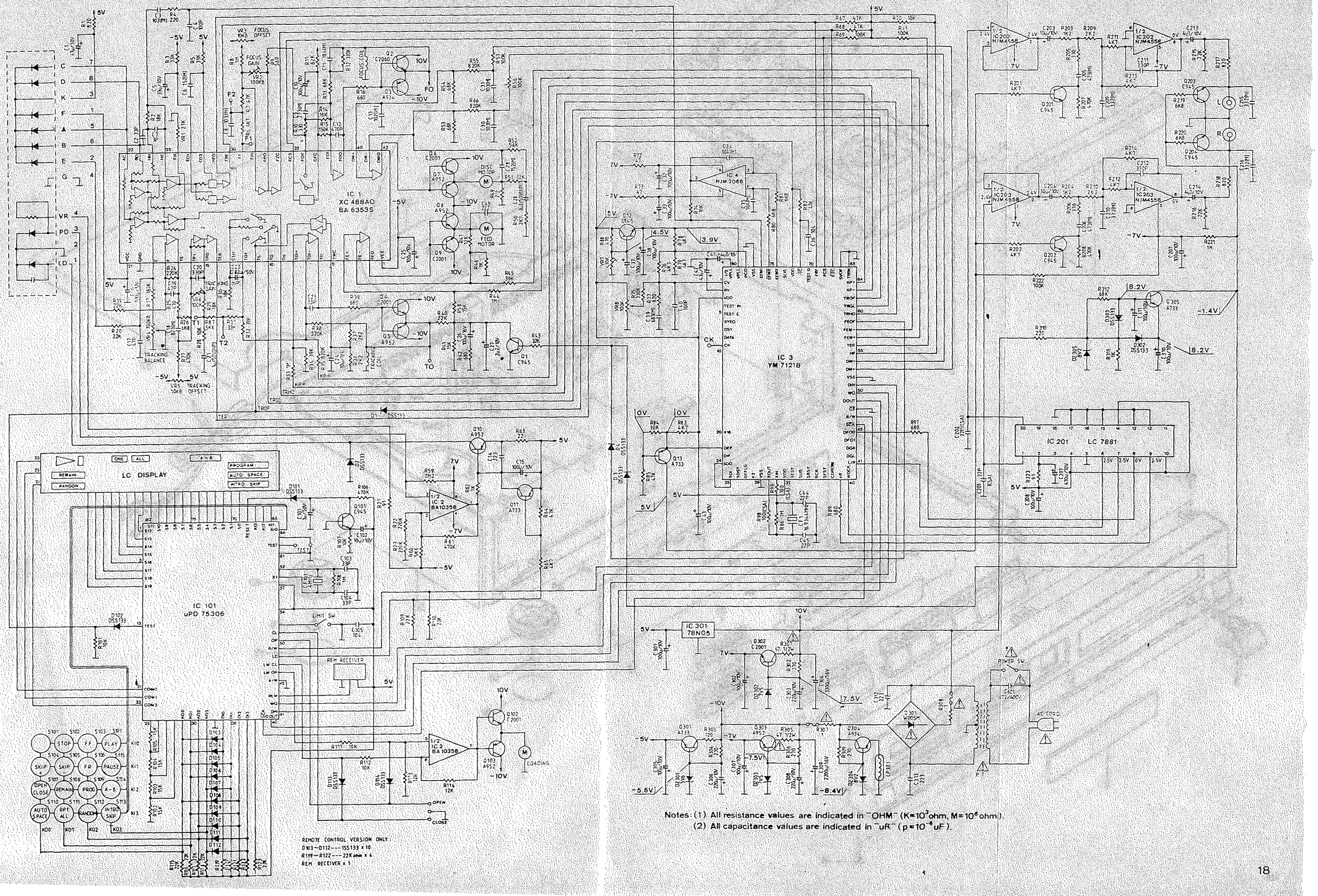


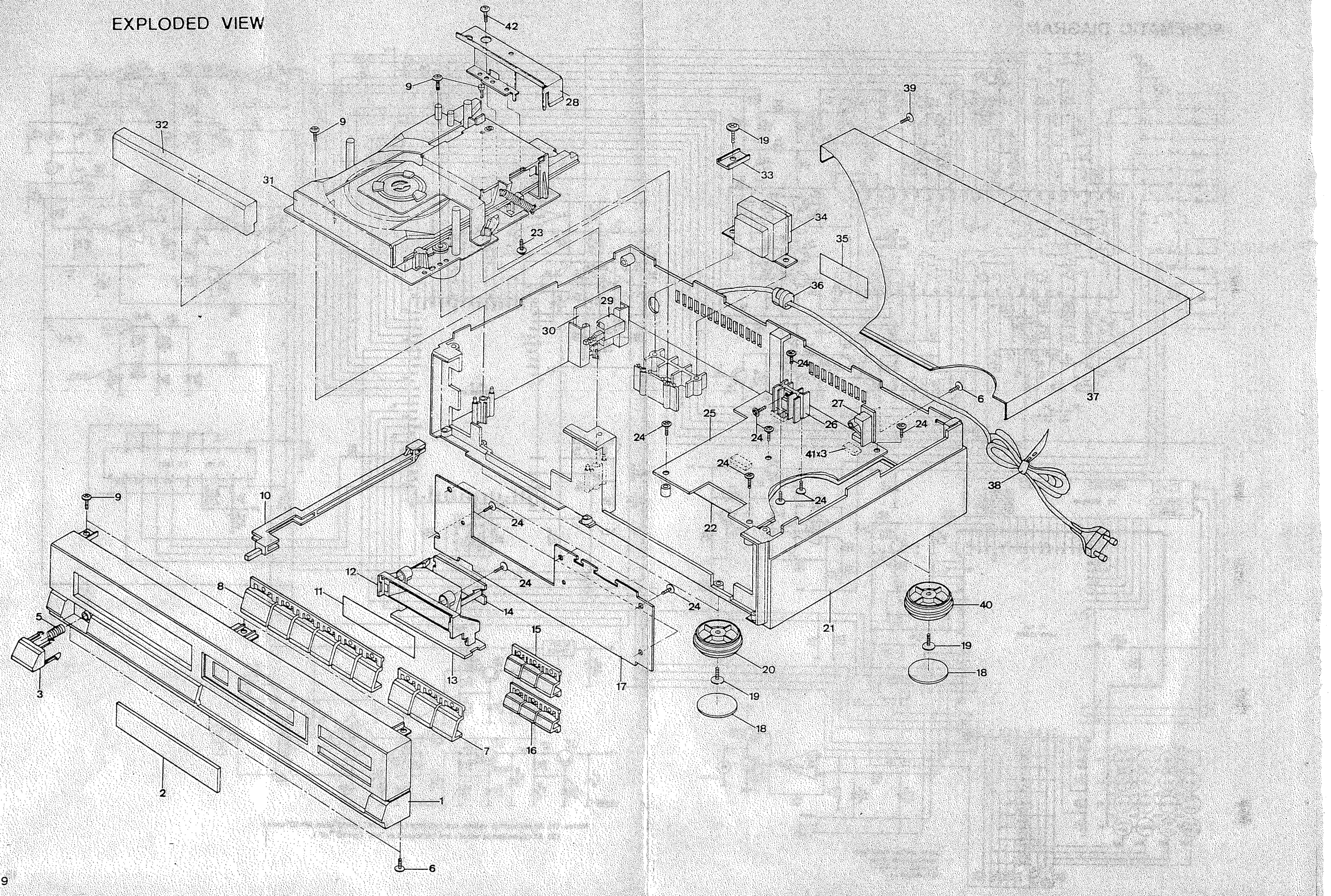
Figure 2

SCHEMATIC DIAGRAM



Notes: (1) All resistance values are indicated in "OHM" (K=10^3ohm, M=10^6ohm).
(2) All capacitance values are indicated in "uR" (p=10^{-6}uF).

EXPLODED VIEW



NO.	PARTS CORD	DESCRIPTION	QTY
1 .	5MDC1666D29000	FRONT PANEL	1
2 .	5MDS1396D55000	DISPLAY WINDOW	1
3 .	5MDK1806D39000	POWER KNOB	1
4 .			
5 .	5MMS1111D01000	SPRING	1
6 .	55310310HO4000	SCREW FOR F/P, BASE, O/P JACK	4
7 .	5MDK1803D38000	CD BUTTON B	1
8 .	5MDK1802D31000	CD BUTTON A	1
9 .	55310310IO7000	SCREW FOR F/P, BASE, CD MECHA	6
10.	5MPF1727D05000	POWER KNOB BAR	1
11.	5MDS1328D07000	DISPLAY FILTER	1
12.	5MPF1591D15000	LCD HOLDER	1
13.	2CPXF1464B	F-1464B LCD DISPLAY P. C. BOARD	1
14.	2CPXF1464C	F-1464C LAMP P. C. BOARD	1
15.	5MDK1804D46000	CD BUTTON C	1
16.	5MDK1805D09000	CD BUTTON D	1
17.	5GPBF151101000	SONTROL P. C. BOARD	1
18.	5MPF1589D09000	FOOT PLATE	4
19.	55360310IO2000	SCREW FOR CD, TRANS., FOOT	9
20.	5MPF1731D04000	FOOT	2
21.	5MDC2110D05000	BASE A	1
22.	5MPF1687D20000	SHIELD A	1
23.	55040306IO2000	SCREW	1
24.	55310308IO2000	SCREW FOR HOLDER, PCB, CD PCB	15
25.	2CPXF1464A	F-1464A MAIN P. C. BOARD	1
26.	5MES1095D07000	HEAT SINK	1
27.	5MEJ1758D04000	2P JACK	1
28.	5MSB2094D08000	TOHEI MECHA SUPPORT	1
29.	5GWA0960D02000	POWER SWITCH	1
30.	5GPBF150517000	POWER SWITCH P. C. BOARD	1
31.	5GCD7812065000	CD MECHA UNIT	1
32.	5MDC1671D14000	CD DOOR	1
33.	5MSB1311D34000	TRANSFORMER CLIP	2
34.	5GTP0240D17000	POWER TRANSFORMER	1
35.	5MDT1406726000	MODEL PLATE	1
36.	5MFC0083D09000	AC CORD STOPPER	1
37.	5MSB1923D04000	TOP COVER	1
38.	5EWP0261215000	AC CORD	1
39.	55310308HO9000	SCREW FOR BASE	3
40.	5MPF1731D15000	FOOT B	2
41.	5MPF1597D06000	50 CUSHION	3
42.	55310312IO1000	SCREW FOR CD MECHA	1

OVERALL WIRING